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January 11, 2010

FILE

John Graves, P.E.
Environmental Manager
Minnkota Power Cooperative
1822 Mill Road
P.O. Box 13200
Grand Forks, ND 58208-3200

Re: SCR Cost Estimate

Dear Mr. Graves:

The Department and the U.S. Environmental Protection Agency have reviewed the "NO_x Best Available Control Technology Analysis Study – Supplemental Report" for Units 1 and 2 at the M.R. Young Station as well as the supplementary information dated December 11, 2009. Based on the information submitted to date, there are several preliminary questions regarding the information presented. Although you addressed several of the concerns in our meeting of December 21, 2009, we ask that you provide a written response to all of the following items so that the final cost SCR numbers can be fully analyzed:

1) How were the SCR reactors sized and the catalyst volume determined and what target NO_x control efficiency was used to size the catalyst? How was the cost of the catalyst determined?

2) Anhydrous ammonia appears to be a less expensive reagent than urea for the SCR system due to local availability. A justification must be supplied for selecting urea over anhydrous ammonia.

3) Support must be provided for the catalyst cleaning/replacement outage periods. This should include an explanation of the method used to estimate the outage time and clarification whether the outage time includes the regular outage period.

4) The indirect capital costs associated with the project appear to be high. A detailed explanation of the estimation method must be supplied.

5) Support must be provided for the cost of natural gas and electricity.

6) More details, including calculations, must be supplied to justify the pressure drops and parasitic loads associated with the SCR configurations.

7) All vendor correspondence related to SCR reactor sizing, catalyst volume, NO_x control efficiency, catalyst cost, catalyst replacement schedule, and catalyst guarantees should be provided. This includes the original requests submitted to vendors and analyst suppliers by Minnkota and its consultants. This must also include the description of the gas stream that was supplied to the vendors.

8) Data must be provided for the temperature gradient of the regenerative heat exchanger to justify the reheat calculations. This must be provided for both LDSCR and TESCR. The 600°F temperature for the reheated flue gas must be justified.

9) A comparison of the SCR costs at the M.R. Young Station versus PSE&G Mercer Station and We Energies Oak Creek Station should be provided or an explanation why such a comparison is not possible or inappropriate. We recognize that each plant has unique characteristics and there will be some design differences from plant-to-plant, but those differences should not necessarily dismiss making a general comparison of costs unless there are unique or extenuating circumstances which would preclude a general cost comparison.

10) Provide additional clarification and technical justification regarding Minnkota's determination that the units at MRYS are boiler limited and cannot generate additional steam for flue gas reheat purposes.

11) There appear to be several discrepancies in the documents that must be addressed including:

    a) The catalyst volume for Unit 2 (p.4-23) is listed as 256 m^3 per layer per reactor or 512 m^3 per layer. This is 4-5 times more than Unit 1 yet Unit 2 is not twice as large. Please verify the Unit 2 catalyst volume.

    b) The reheat for Unit 2 for TESCR is listed as 48.11 MMBtu/hr per reactor and for LDSCR is 45.55 MMBtu/hr per reactor. The differential between TESCR and LDSCR is much less than for Unit 1 (60.3 MMBtu/hr and 31 MMBtu/hr). Please explain this difference.

    c) The capital costs for the "stand alone" SCR (p.3 of attachments to December 11, 2009 submittal) do not total correctly. Please check the numbers and revise the documents as necessary.

    d) The flue gas reheat burners and fans appear to be included in both the "SCR system equipment" and "Auxiliaries" cost estimates (see p.4 of attachments to December 11, 2009 submittal, footnotes 1 and 3). Please check this and revise the documents as necessary.

We ask that you supply the requested information by February 11, 2010.

If you have any questions, please feel free to contact us.

Respectfully,

Terry L. O'Clair, P.E.
Director
Division of Air Quality

TLO/TB:csc
xc: Hans Buenning, EPA
Maggie Olson, Asst. Attorney General